

Claims

[1] An image processor for medical treatment support for monitoring the treatment process by obtaining a tomographic image of an object to be examined comprising:

a treatment target region setting means for selecting a monitoring image from the tomographic image, and for setting a treatment region as an objective on the image thereof;

a treatment-completed region setting means for setting the region where the treatment is already considered completed on the monitoring image; and

a total treatment time estimating means for estimating the time up to the completion of the treatment target region being set by the treatment target region setting means based on the treatment-completed region.

[2] The image processor for medical treatment support according to claim 1, wherein the total treatment time estimating means obtains each of the distance from a reference point which is the starting point of the treatment to the outline of the treatment-completed region with regard to the treatment-completed region on a plurality of monitoring images, and estimates the total treatment time based on the change of distance.

[3] The image processor for medical treatment support according

to claim 2, wherein the total treatment time estimating means, on the treatment target region, sets straight lines being extended radially from the reference point at equiangular intervals as the reference lines, and estimates the total treatment time based on the treatment progress on the reference lines.

[4] The image processor for medical treatment support according to claim 2, wherein the total treatment time estimating means specifies at least one reference line which bisects the treatment target region from the reference point, obtains the points of which perpendicular lines to divide the reference lines with predetermined intervals intersect with the treatment target region, sets the lines connecting these points and the reference point as further reference lines, and estimates the total treatment time based on the treatment progress on the further reference lines.

[5] The image processor for medical treatment support according to claim 2, wherein the total treatment time estimating means sets the lines connecting the reference point and the pixels with predetermined intervals out of the pixels on a display means for displaying the outline of the treatment target region as the reference lines, and estimates the total treatment time based on the treatment progress on the reference lines.

[6] The image processor for medical treatment support according

to claim 3 to 5,

wherein the treatment target region setting means sets the region by synthesizing a plurality of closed curves and smoothing the cross-over sections thereof, and

the total treatment time estimating means sets reference lines on every said closed curve, and estimates the total treatment time based on the treatment progress of those plurality of reference lines.

[7] The image processor for medical treatment support for obtaining a tomographic image of an object to be examined and monitoring the treatment process comprising:

a treatment target setting means for selecting the monitoring image from the tomographic image, and setting the treatment region on it as an objective;

a treatment-completed region setting means for setting the treatment-completed region which is a region considered that the treatment is already completed on the monitoring image; and

a display means for estimating the treatment region after passing a predetermined time based on the treatment-completed region, and displaying this estimated treatment region with at least one hue information.

[8] The image processor for medical treatment support according to claim 7, wherein the display means displays as allocating different hue information to each of the treatment target region,

treatment-completed region and the estimated treatment region.

[9] The image processor for medical treatment support according to claim 7, wherein the display means displays, as allocating the hue information to the above-mentioned treatment target region.

[10] The image processor for medical treatment support according to claim 7 or 9, wherein the display means displays as allocating hue information to the treatment target region, as well as the change of the region under treatment with color indication.

[11] The image processor for medical treatment support according to claim 7 or 9, wherein the display means displays as allocating different hue information to each of the treatment-completed regions at a plurality of time points.

[12] The image processor for medical treatment support according to claim 7, 9, 10, or 11 wherein the display means displays as allocating hue information in incremental steps to the estimated treatment region.

[13] The image processor for medical treatment support according to claim 7, 9, 10, or 11 wherein the display means displays each of the above-mentioned estimated treatment regions at a plurality of points with desired color gradation.

[14] The image processor for medical treatment support according to claim 7 to 13, wherein the display means displays

by superimposing one or both of the estimated treatment-region and/or the treatment-completed region on the treatment target region.

[15] The image processor for medical treatment support for obtaining a tomographic image of an object to be examined, and monitoring the treatment process comprising:

- an image memory for storing data for creating the tomographic image;

- a measurement calculating means for obtaining the measurement value from the data for creating the tomographic image;

- a measurement/temperature converting means for converting the measurement value into temperature;

- a color table for temperature-color display by allocating hue information with regard to the temperature being converted;

- a look-up table for allocating the gray scale to the data for creating the tomographic image being stored in the image memory;

- a monitoring mode switch for indicating the synthesis of the temperature-color display and the data for creating the tomographic image being allocated with gray scale; and

- a display means for displaying the synthesized image of temperature-color display and the data for creating the tomographic image as an image.

[16] The image processor for medical treatment support according to claim 15, wherein the measurement/temperature converting means converts CT value into temperature, by setting CT value as measurement value that the tissue in the vicinity of 25 degrees of which the CT value is 0 has the CT value of -20 ~ -50 at below 0 degree of temperature.

[17] The image processor for medical treatment support according to claim 1 or 2, comprising:

- a treatment support display mode selecting means for selecting the display mode for treatment support;

- a time selecting and input means for inputting the time after the starting of treatment, of the treatment progress image being intended to display;

- a treatment progress image creating means for creating the treatment progress image at selected times; and

- a display means for displaying one or both of the treatment target means and/or treatment-completed region, and the treatment progress image.

[18] The image processor for medical treatment support according to claim 17, comprising a difference image creating means for creating a difference image of one or both of the treatment target region and/or the treatment-completed region and the treatment progress image, wherein the display means displays one or both of the treatment target region and/or the

treatment-completed region and the difference image.

[19] The image processor for medical treatment support according to claim 17 or 18, wherein the display means displays as allocating different hue information to the treatment target image, the treatment-completed image, the treatment progress image and the difference image.